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ABSTRACT

The membership of the Southeast Industrial Arts Conference was commissioned at its annual meeting in Atlanta in 1970 to develop position statements on a variety of questions and issues facing industrial arts in the Southeast. Prepared by a task force having 10 groups of members, this report contains the position statements developed at this conference, including educational objectives and educational needs relating to 10 aspects of industrial arts education and program development in the Southeast. Topics discussed include: (1) the role of industrial arts in assisting youth to cope with a changing society, (2) its contribution to general education, (3) federal support for industrial arts, (4) programs for the gifted, (5) industrial arts as special education, (6) industrial arts as compensatory education, (7) the role of industrial arts in vocational education, (8) industrial arts education as recreation, (9) industrial arts in consumer education, and (10) industrial arts for self-realization. (AG)

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INDUSTRIAL ARTS IN THE SOUTHEAST

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A TASK FORCE REPORT ••• SOUTHEAST INDUSTRIAL ARTS CONFERENCE

FOREWORD

The membership of the Southeast Industrial Arts Conference at its annual meeting in Atlanta in 1970 was commissioned to develop position statements on a variety of questions and issues facing industrial arts in the southeast. With some preparation in advance, ten groups of members, each a task force spent the conference period in preparation of its position. These constitute the Task Force Report "Industrial Arts in the Southeast".

Delmar W. Olson
The Taskmaster
Raleigh, N. C., March 15, 1972

(Published at North Carolina State University under the supervision of Mr. E. Allen Bame)

INDUSTRIAL ARTS: ITS ROLE IN ASSISTING YOUTH TO COPE
WITH A CHANGING TECHNOLOGICAL CULTURE

To discuss this topic, some agreement on definition of terms is necessary Authorities have defined culture, technology, and industrial arts as follows: Culture is "that complex whole which includes knowledge, belief, art, morals, law, custom, and any other capabilities and habits acquired by man as a member of society." (E. B. Taylor, Primitive Culture, Vol. 1, John Murray, London, 1871). Technology, in its basic cultural meaning, refers to all of the social customs by which people manipulate material entities and substances of all kinds. It includes the techniques of manipulating raw materials to produce artifacts, ways of handling or modifying artifacts, and means of manipulating animal and human bodies, including one's own body. (John J. Honigmann, The World of Man, Harper and Row, New York, 1963) Industrial Arts has been defined as "a discipline in general education. It is the study of the technology: its origin, development, advance, and impact; its technical, social, economic, occupational, cultural, and recreational nature and influences, through study, research, experiment, design, invention, construction, and operation with ideas, materials, tools, processes, products, and energies; for purposes of acquainting the student with the technological culture, aiding him in the discovery and development, release and realization of his potential therein, and enabling him to better cope with cultural change caused by technological advance." (Delmar W. Olson, "Industrial Arts: Interpreter of Technology for the American School," 3rd edition, North Carolina State University, 1970)

It is generally agreed that a primary function of the societal institution we call the school is to acquaint the young with the nature of their culture. Advanced societies are distinguished by their intensely technological cultures. It follows that schools must, then, provide youth with learning opportunities related to the technological aspects of the culture, not only to assist students to understanding their culture, but also to aid them in finding their own place and potential.

Technology is seen as a manifestation of man's creative nature in his material world, as being the total of what man knows about and does with materials -- and more. It is seen as man's gaining advantage over nature, of creating a new environment and a new culture, of remaking himself through the influences of his creations. It is also man at work in productive occupations and skills and enjoying the leisure time and opportunities available as products and outcomes of technological advance. It is also the problems associated with obsolescence, congestion, pollution, and contamination due to technology (and its operational form, industry) advancing more rapidly than man's capabilities to cope with change and to foretell the consequences of industrial-technological development.

THE ROLE OF INDUSTRIAL ARTS - INTERPRETER OF TECHNOLOGY

Industrial arts education draws its content from technology, and its main objective is to aid all students in developing the technological literacy necessary to understand their culture. This is accomplished through real and simulated experiences in active laboratory situations, and by conventional pedagogical methods. Technological literacy,

more than merely a verbal familiarity, is taken to mean "knowledge, understandings, appreciations, expressions, skills, and achievement with materials, tools, machines, ideas, and energies (Olson, op. cit.) and, in addition, the organizational techniques employed by business and industry to accomplish their goals.

IMPACT OF INDUSTRIAL ARTS EDUCATION ON INDIVIDUALS AND ON SOCIETY

The study of the changing technology, as undertaken in modern industrial arts curricula, equips the student to:

(1) Recognize the dimensions and consequences of technological development and change.
(2) Understand the technological and industrial aspects of society, and the interrelationships of society and technology.
(3) Interpret the effects of changing technology on the culture's evolving value systems.
(4) Act as a rational being, capable of intelligent, effective, productive living in the sociocultural environment.

CONCLUSIONS

Since technology and rapid technological change are pervasive aspects of our culture, and since youth must become acquainted with the nature of the culture in which they live, it follows that education must provide for the development of technological literacy by all students. And, since technology is an active, material manifestation of man's creative nature, studies of the technology must take place in an active setting and deal with the objects of man's ideation and creation -- tools, machines, materials, and energies. Increasingly, skill must be defined as a "capacity to learn", rather than merely an ability to perform certain tasks. (Drucker)

In order to assist youth in learning to cope with technological change, industrial arts education must be both historically and futuristically based. Historical perspective is necessary in order that youth come to realize, early in life, that things were not always as they are now -- that most of the technological change man has witnessed has occurred only in the past 150 years or so. Students must be familiar with history of technology in order to discern the effects technological change has had upon man's culture and institutions and upon the quality of his life. Similarly the student stands at a pin point in time and we cannot dwell with undue concentration upon the present state. We must, with out students, peer into the future and be predictive of it, in order that they may learn to participate in making positive change, for the improvement of the quality of life.

The Task Force

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THE CONTRIBUTION OF INDUSTRIAL ARTS TO THE GENERAL EDUCATION OF YOUTH

In any discussion of general education the first task is to strip away the semantic confusion which inhibits effective communication. The most troublesome aspect is the tendency to equate general education as that which is not vocational or as "not elsewhere classified" Both are negative while the intent of general education is described in positive outcomes which necessitates a positive approach to the teaching-learning process.

The literature contains the following objectives: to develop a personal ethical code which is consistent with the ideals of democracy; to participate actively in the affairs of society at all levels; to understand other cultures and try to foster interantional peace; to understand common phenomena in the physical environment and especially the methods of the scientist; to be able to communicate effectively; to attain satisfactory emotional adjustments; to maintain one's own health; to understand and enjoy aesthetic experiences and to share in some creative activity; to have a satisfying family life; to select an occupation realistically; and to think critically. In other sources one may find these and additional objectives: to achieve synthesis; to learn broad concepts, basic terminology, and methods of thought in various disciplines; to achieve integration of knowledge; to explore different areas of learning; and to nurture intellectual curiosity.

OBJECTIVES	ACTIVITIES
(1) Develop a personal ethical code consistent with the ideals of democracy.	The personnel system, approval and disapproval of non-democratic acts, practice in democracy in decision making.
(2) To participate actively in the affairs of society at all levels.	See #1.
(3) To understand other cultures (...)	Comparative crafts, history of national technological development.
(4) To understand common phenomena in the physical environment.	Explanations of machining, work, safety, cleanliness, etc. in terms of physical and biological principles.
(5) To understand the method of the scientist.	Emphasis on: the "open ended" or inductive method of reasoning. The accumulation and treatment of data in problem solving. The terminology used by the scientist which is also common to those in the various technologies.

OBJECTIVES (cont.)	ACTIVITIES (cont.)
(6) To be able to communicate effectively.	Stress on vocabulary development - including technical and scientific terminology uses in the technological fields. Stress on language skills.
(7) To attain satisfactory emotional adjustment.	Emphasis on the discovery of talents and the development of skills. Emphasis on wise occupational choice.
(8) To maintain one's own health.	Stress on safety, laboratory cleanliness, personal sanitation, proper lifting and carrying procedures. First aid, etc.
(9) To understand and enjoy esthetic experiences.	Develop sensitivity to design in products. Develop ability to add the "esthetic touch" in designing.
(10) Share in some creative activity.	Encourage the creative act - problem solving in materials and processes. Arts and crafts and ceramics. Encouragement to develop recreational interests and skills.
(11) To have a satisfactory family life.	Development of home mechanic skills, consumer skills, product evaluation skills.
(12) To select an occupation realistically.	Provision for evaluation of talents and interest in tryout situations. Development of pre-entry skills at advanced levels. Provision for occupational information in the areas of technological employment.
(13) To think critically.	See #4, #5, #6, and #9.
(14) To achieve synthesis.	Concept development, integration of language, science, construction, etc. Develop generalized procedures in problem solving.
(15) To nurture intellectual curiosity.	Emphases upon cause and effect, basic concepts, bases for research and development, etc.

The activities which are given as examples are not intended to be complete but as a typical approach to General Education - Industrial Arts.

Perhaps it is to be noted that the realization of these objectives depends upon teacher's attitudes and attention to details. They do not occur incidentally to technically oriented teaching.

The Task Force

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FEDERAL SUPPORT FOR INDUSTRIAL ARTS

Many views represent the profession on the subject of federal support for Industrial Arts. They may, however, be summarized as follows:
(1) funding from any source should be sought;
(2) additional funding is not needed;
(3) help from somewhere is needed.

In general, industrial arts needs an expanded network of supervisors and administrators to provide communications. Specifically, there is need for in-service programs to up-grade and maintain teacher competency; to assist local schools in providing the necessary hardware, software and facilities; and to provide salary supplements to teachers to make it financially possible for them to earn as much teaching industrial arts as any other subject.

A major problem arises when we speculate on ways in which additional funds may be obtained for industrial arts. To date, the profession has refused to identify a philosophy, definition, and set of objectives. Without these basic essentials, we are unable to communicate a logical reason even for our existance, let alone our need for Federal funds. Until this task can be accomplished further consideration of the topic is purely academic.

Assuming that the profession does indeed adopt a guiding philosophy, definition, and set of general objectives reflecting the image of Man, Society, and Technology, certain conditions and courses of action might then be considered. Some of these may be identified as follows:
(1) Industrial arts should be offered in every school including grades 7-12. No school should be recognized as an accredited (standard) school if it does not provide at least one unit of industrial arts.
(2) The profession should develop an introductory industrial arts course.
(3) Funding of schools should be on a teacher-pupil basis only. It is unrealistic for one area of the school program to be capable of outbidding others for personnel and position in the school curriculum solely on the basis of its superior financial status.
(4) An occupational or career element should be a part of every subject area. Provision of this kind of instruction is not the sole perrogative of any one school subject. Statements of educational objectives have traditionally reflected a concern for this matter. Consequently, funding for this purpose should be across-the-board rather than to one subject area.
(5) Practices of funding vocational education to enable it to duplicate the functions of industrial arts (one of the "services" of vocational education divisions in state departments of education) is irresponsible and should be halted. Furthermore, such practice is rapidly producing a dual school system and is neither economically or educationally sound.
(6) Cognisance should be taken of the opportunities for funding in the Environmental Education Act (in process). Man, Society, Technology and Environment provide interesting challenges and opportunities.

(7) Serious attention should be given to the matter of modifying industrial arts to meet the requirements of Vocational Education funding. By so doing, Industrial Arts runs the risk of being assimilated by the donor. However, it should be recognized that it is necessary to first infiltrate the oppositions camp before assuming a leadership role. The better approach is most likely through the acts such as ESEA and NDEA.

The Task Force

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INDUSTRIAL ARTS FOR THE GIFTED

Most industrial arts educators will agree that the scientific achievements and technological advancements of our time have increased man's ability to completely transform his total environment, and by doing so, transform himself, his institutions and his life styles in the process. Survival in our technically oriented civilization depends upon our ability to adapt to these new technological advancements and to control these changes so that they remain in the realm within which society can adjust.

In our democratic society, control of technology can be realized only with public understanding of the nature, the capabilities, the limitations and the trends of our technology. Furthermore, it needs to interplay with social, economic, political, and psychological forces in order to be completely understood and effectively controlled by the culture it is supposed to serve.

It is the view of this Task Force that Industrial Arts has a special responsibility to the public to develop technically literate citizens who are capable of making intelligent decisions in the years ahead. Further, society's need for the gifted portion of the technically literate is overwhelming. The problem is, how do we in industrial arts develop programs to offer the gifted the challenges they need? Are we doing all we can to develop such programs for them?

Task Force Goals

This task force group was charged with the responsibility of identifying the characteristics and needs of the gifted learner (the target group) as well as defining characteristics within industrial arts programs that are specifically designed to challenge these gifted learners. (Characteristics of programs for the gifted.)

The Target Group

According to Good's Dictionary of Education, the gifted child is defined as: (1) a child whose mental age is considerably higher than his actual age compared with children in the general population; (2) a child who is far more educable than the generality of children; (3) a child whose performance is consistently remarkable in a worthwhile type of human endeavor.

It appears rather ironical that education claims the objective of assisting the individual in achieving his greatest potential and then often measures giftedness in terms of general comparisons. This technique eliminates the individual with an intense desire and maximum ability in an area of his choice from being acclaimed as "gifted".

The task force position is that while recognizing the existence of the "only gifted" (talented in one area only), society tends to recognize only those who are "generally gifted". Therefore, the task force directs its study toward the "generally gifted" and in the more realistic terms of their "functional characteristics".

Functional Characteristics of the Gifted

Educational psychologists tell us that the gifted learner differs from the others in that he possesses the ability to deal with abstraction as well as generalization. He has accumulated a greater abundance of background knowledge upon which to generalize and to particularize from his generalizations. He seems to be able to apply his background knowledge to new things very effectively. He has a wider variety of interests and he tends to emerge as the leader or the mainspring of any group. He is very creative and wants to be challenged. He has a marked ability to solve problems, develop theoretical models, fabricate technical devices and to invent new things. He has high ideals and a worthy set of values. His expectations are high as well as his learner often conceals himself within his peer group and many times he is difficult to detect.

Technically related activities toward which the "gifted" tend to gravitate are generally scientific in nature such as research and development and product and production engineering. Other areas are market research, finance, management, personnel administration, and legal and external relations.

Characteristics of Programs for the Gifted

The gifted boy or girl needs to function in an interdisciplinary environment which provides nurture for his abilities and diverse interests. In such an environment he is able to use his mind and express his ideas, and develop his communication skills, and other talents, to a high degree.

Providing programs for the gifted requires a very different set of parameters than for the average student. Characteristics of such a program would embrace all of the following elements:

- An inquiry-oriented "laboratory for learning"
- A completely open-ended (not subject centered) learning activity
- A stressing of individual investigation
- Learner-directed research and development and reporting activities
- Creative and contemporary problem-oriented actual experiences in decision making
- Self-challenging and motivating
- Utilizes "beyond the classroom" resources
- Inter and intra-disciplinary in nature
- A different "mode of thought" -- (there is no failure in research only delayed success)
- Development of theoretical "models" and "prototypes"
- Cognizance of the latest in technological and research developments across the fields
- Imagineering and interdisciplinary environment
- Role of the teacher as a stimulator and resource person (a director of learning)

- Low teacher-learner ratios
- Use of the language, equipment and tools of the researcher
- Seminar techniques versus dogmatic lectures
- An accelerated program for K-12 with appropriate variation in depth for each grade level.

Unless cognitive opportunities, as outlines above, are designed into the industrial arts curriculum it is questionable whether or not industrial arts will ever have much to challenge the gifted.

Industrial Arts Programs to Challenge the Gifted

Unfortunately, there are very few ongoing programs that actually meet the needs of the gifted within our industrial arts programs.

Allowing students a free lab period to explore their special areas of interest or placing them in "honor groups" represents the typical approach. However, this structured program is superficial at best.

The space program has suggested some exciting new learning concepts in the form of (1) research and development, (2) junior engineering and technology, (3) space technology, (4) in-depth studies of industries, (5) comparative technology, and (6) individual or team investigative and problem solving activities with industry. Some pioneering work has been accomplished in these areas.

The research and development approach represents a major departure from the traditional arts program to one which involves the student with complex problems, concepts, theories and interdisciplinary relationships which are directly associated with contemporary methods and techniques of modern day industry.

A pre-technical program of "Junior Engineering and Technology" at the high school level could also help to satisfy the special needs of the gifted. This approach permits the student to "game" and simulate real life situations just as the engineer simulates real situations with models. It involves learners in concepts, theories, and techniques that have contributed to the development of our technological society. He studies engineering concepts and explores the physical principles behind the concepts. In this approach the technical problem-solving method is introduced and expanded to include the more creative phases of engineering (i.e., design, modeling, and prototype development). It is not enough to manipulate numbers and materials in junior engineering; he must be able to see new applications for old scientific principles and to assume the leadership in formulating imaginative solutions to unfamiliar problems. Appropriate engineering specifications are developed and prototypes fabricated and tested. The results are then presented in the form of technical papers to the public. By such activities the gifted learner gains a first hand knowledge and understanding of the types of problems likely to be encountered in the practice of engineering science.

A third possibility involves the study of space technology with all of its implications for industrial arts education.

Space technology suggests completely new directions, concepts, instructional methodologies, techniques, technical processes, materials and adds the interdisciplinary dimension to the teaching of industrial arts as well. No other area represents and reflects the advancing technologies (i.e., computers, outer space, inner space, power, materials, communications, management, extractive processes, systems, bio-engineering, bionics, cryogenics, cybernetics, fabrication, food, nuclearonics, ecology, and instrumentation) as well as space technology. This direction also provides a comprehensive approach to the kind of educational experience that is really geared for the gifted who must function in the world of tomorrow.

All of these pioneering programs are centered and provide an interdisciplinary overview of our technological world. Each student selects his own individual problem, most of which require original thought for their solution. Many require extensive research and the use of sophisticated equipment of the type normally found in industry. They all deal with updated materials and techniques in the solution of technical problems.

Committment for Action

On the basis of its deliberations and other supporting evidence the task force strongly recommends the following action by the SEIAC:

I. Petition to the Resolution Committee of the AIAA as follows:

A. Whereas: our present industrial arts programs appear to be unable to effectively cope or keep up with the dynamic technical changes that are taking place in our technological society and

B. Whereas: there are so very few programs in industrial arts that would really challenge the "gifted"

C. Be it resolved that the SEIAC petition the Resolutions Committee of the AIAA to take positive action and assume national leadership on the following recommended items:

1. Identify, encourage and publicize the development of existing or pioneering programs that really challenge the gifted.
2. Encourage the design and development of new programs that would attract and challenge the gifted teacher at industrial arts teacher-training institutions. Solicit necessary funds for support of programs holding the most promise.
3. Organize, staff and financially support a national "Awards Program" to recognize outstanding technical achievement by industrial arts learners.
4. Develop at the national level a "Center for Gifted Studies in Industrial Arts", to identify, develop and distribute to the profession new resources and materials associated with the newer approaches that would attract and challenge the gifted. Adequate funding by AIAA should support this operation.

The Task Force

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INDUSTRIAL ARTS AS SPECIAL EDUCATION

The group has agreed that the person who is classified as slow, handicapped, or underachiever is really mentally handicapped. Being mentally handicapped refers to a mental disability which restricts a person in his mental maturation processes in learning, performance, social growth, and behavior. It restricts his intellectual growth to such a degree that he is limited throughout his life in his ability to function in the "normal" manner. The group further agrees that industrial arts has a responsibility in the educational program for the mentally handicapped. Industrial arts in this context needs to be clarified. It is the conclusion of the group that industrial arts assumes a different connotation at various educational levels, for instance:

1. Industrial arts at what is commonly considered to be the elementary level may have more significance as a method of instruction than as a content area. At this level, it can enhance special education programs.
2. At the intermediate level, industrial arts activities should further enhance the educational program to the extent that it begins to approach what is usually accepted as industrial arts. In this context the value of such work habits as: following directions, persistance in the completion of a task, pride of workmanship and numerous other qualities of this nature, normally attributed to the study of industrial arts become the objectives of the program. Such programs are usually supervised by the industrial arts instructor who should have a special program of teacher education to permit him to function adequately.
3. For those handicapped students who enter the secondary program, industrial arts may begin to assume some of the objectives of a vocational program. Very few mentally handicapped persons ever enter a high school vocational program. If they receive any occupational experience in the usual school environment, industrial arts may be one of the areas in which these experiences are provided. The development of the individual to his fullest capacity should be the objective of all levels of industrial arts instruction. The attainment of "industrial arts" objectives per should be secondary. Thus, if industrial arts activities encourage him to remain in school longer, which in turn permits his maturation in his peer group to continue, this alone with becomes justification for the industrial arts program and it should be considered to be successful.
4. Industrial arts at the college level becomes a very important component of the special education teacher education program. Special education students should be introduced to industrial arts content and methodology, they should become proficient in the integration of these components in the primary and intermediate programs in which they are involved and become formaliarized with the objectives of industrial arts for the mentally handicapped at the secondary level in order to be able to assist in the transition which takes place at this time.

The Task Force

Tom Brennan, Chairman ---------- West Virginia University
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Carlos Boyte ---------- University of S. Mississippi
Norman Bedwell ---------- University of Alabama

INDUSTRIAL ARTS AS COMPENSATORY EDUCATION

This task force recognizes the impoverishment, illiteracy, lack of motivation, and a multitude of other problems which are characteristics of disadvantaged groups. We recognize that there are several types of disadvantaged groups: (1) disadvantaged inner city youth, (2) disadvantaged rural youth, (3) disadvantaged children of migrant farm workers, and (4) disadvantaged children of foreign speaking aliens, refugees, and citizens. It was also agreed that our public schools have shamefully neglected many problems that these groups present and face.

What then can industrial arts do to help compensate for the deplorable conditions of disadvantaged youth? To ask this question is not to say that industrial arts has been totally remiss in dealing with the problem. Admittedly, industrial arts has done as much, if not more, than other disciplines in dealing with the problem. The total effort, however, has not been significant enough on a widespread basis. The industrial arts profession, therefore, needs to assume responsibility and leadership in several ways if it wishes to meaningfully attack the problems of disadvantaged youth. Our first assumption in analyzing this problem was that the content structure of industrial arts (as expressed in these times) need not be drastically changed in dealing with the problems of disadvantaged youth. Our feeling was that a change in methodology of presenting the content, in preparing the teachers, and in changing the schools, is where the industrial arts profession should strive to make widespread impact on the problem. A comprehensive approach to the problem we felt should involve the profession in many areas of improvement. Our recommendations to the profession are as follows:

1. Make a concerted effort to relate our content to the experiences and self-images needs of disadvantaged youth.
2. Bring together the firsthand knowledge and background experience of individuals who have worked directly with disadvantaged youth.
3. Use these key individuals as consultants and advisors to help state and local educators to develop relevant curricula, new methodologies and services that would best suit disadvantaged youth.
4. Involve the disadvantaged youth in planning industrial arts programs for them.
5. Many disadvantaged youth drop out of school before they reach the grad level where they can take industrial arts courses. Worse, is that they leave without any orientation toward the industrialized world in which they enter. Therefore, industrial arts must institute programs in our disadvantaged elementary and middle schools.
6. Industrial support must be enlisted to provide jobs and scholarships for disadvantaged youth.
7. Attempts should be made to recruit disadvantaged youth into industrial arts teaching. Incentives should be provided for industrial arts teachers to recruit these disadvantaged youth.
8. At the university level, teacher education courses related to relevant industrial arts approaches for disadvantaged youth need to be developed.
9. Industrial arts teacher education students need experience and exposure to disadvantaged situations. This exposure must be well planned and well thought-out so it will not be frightening or defeating.

10. Model industrial arts programs for disadvantaged youth must be developed, evaluated, and improved.
11. Continuous in-service and summer programs for industrial arts teachers are necessary to inform them of special curricula, methodologies, and services that are being developed for disadvantaged youth.
12. Consideration must be given to providing special certification, and possibly extra pay, for those industrial arts teachers of disadvantaged youth.
13. A solution to the high turnover rate of industrial arts teachers in disadvantaged situations needs to be found. Research and studies to find these solutions need to be conducted by the industrial arts profession.
14. A national industrial arts task force or forum should be organized solely for the purpose of dealing with the problem of industrial arts programs for disadvantaged youth. This must go beyond the point of being philosophical. Industrial arts must actively become involved with the problem on an operational basis. Finally,
15. The industrial arts profession must organize or become involved with national or state center responsible for disseminating materials and information regarding the education of disadvantaged youth.

Undoubtedly, there are many other factors outside the sphere of education that influence disadvantaged youth. Many of these are poor home environment, lack of sufficient motivation of the parents to make their children take advantage of educational opportunities, insufficient education of parents, and lack of family funds to sustain a normal and healthy standard of living.

While industrial arts cannot hope to correct all of those negative influences the recommendations just stated could at least help to improve the school situations and offerings for disadvantaged youth.

The Task Force

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THE RELATIONSHIP OF INDUSTRIAL ARTS AND VOCATIONAL OCCUPATIONAL EDUCATION

Educational, technological, and societal change has accelerated during the past decade and had dictated a concern for the career development of all pupils within the total program of education, grades K-12. The curriculum of the past which places overwhelming emphasis on a sequence of courses for college entrance is no longer educationally sound. A true concern for all pupils identifies the need for a more realistic and comprehensive sequence of courses for career development.

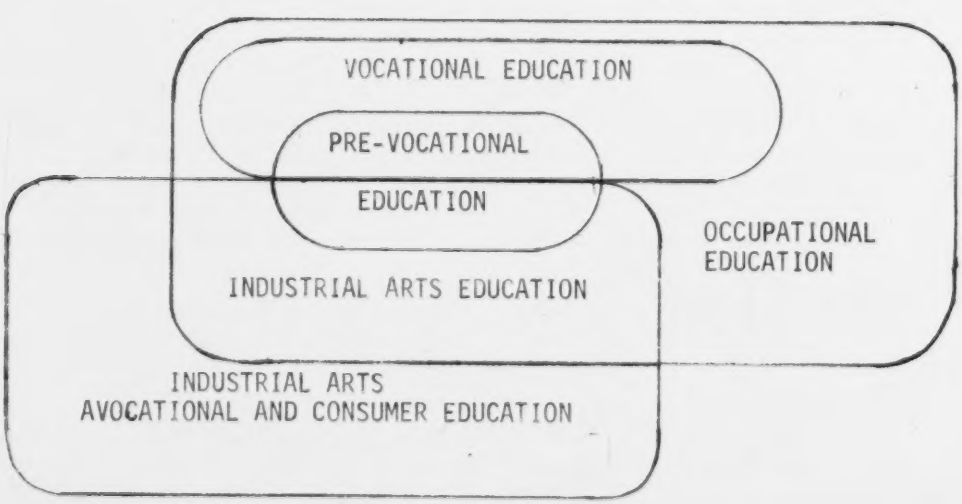
Traditionally, there has been a trend for each subject field to organize and teach its content apart from other subjects. This separatism organized vocational occupational education for the primary purpose of job-entry preparation. On the other hand, industrial arts education denied any relationship to job training and insisted upon broad general education purposes.

A national and state consciousness of the need for educational efforts more commensurate with the needs of all pupils has resulted in federal and state legislation mandating a broader and more comprehensive vocational education.

Terminology to describe the legislative intent into school programs has been elusive. What occupational education, pre-vocational education, vocational education, and even industrial arts education means to one person has not carried the same interpretation for another person. Occupational education means many things to many people.

It is apparent that schools need a comprehensive program of career development in which each pupil may follow an individually designed program of studies. Industrial arts, occupational, pre-vocational, and vocational education are mutually inclusive in this aspect and must be equally important rather than competitive one to the other.

Definitive statements for occupational education and its elements -- industrial arts, pre-vocational, and vocational education -- are virtually impossible because of the overlapping purposes and content. Relationships are shown by the following diagram:



General education courses are also an integral part of the sequence which assists in a vocational choice. A pupil's achievement in mathematics, science, and language arts tends to develop his self concept and decision ability toward advance study. At the same time elective courses such as home economics, agriculture, industrial arts, and business are most important for self appraisal during the sequential development of an occupational choice.

During the elementary and early secondary years, a comprehensive structure of many activities related to the world of work is better suited to pupil maturity and needs than specific vocational courses. The purposes of courses at these levels are to (1) provide a broad knowledge of the world of work, (2) provide practical, tactile, tryout experiences with materials and tools, and (3) assist in a realistic self appraisal by pupils of themselves and of possible occupational and educational goals. Actually, the entire school must recognize the prime importance and necessity of courses which lead to the careful selection of one's occupational goal.

In the earliest secondary grades, usually 7-8, industrial arts should have a major role, especially for boys, for this is a critical, initial stage of career development. The stated objectives of industrial arts are the same as those behind the intent of the Vocational Education Act. Industrial arts provides realistic laboratory experiences which initiate pupils to the complex industrial-technical society at an age when they cannot do actual work on a job (because of labor laws). There are few opportunities for seventh and eighth graders to obtain experience in our world of work yet orientation is important here.

Industrial arts provides technical breadth, flexibility, and adaptability through its instructional content, techniques, and methods. These are important prerequisites for vocational success today. Industrial arts is concerned with all the elements of industry; production, materials, energy, and power, processes, management, marketing, personnel, communication, services, finance, and research and development. In this context industrial arts is pre-vocational and vocational and consequently a primary course in the occupational preparation of pupils.

In the senior high school or upper grades a variety of special vocational courses become available for selection by the pupils. After the initial industrial arts experience comes the specific training for a vocational pursuit at whatever time in the sequence of courses a pupil makes his vocational choice. A career development sequence of courses is characterized by a broad general education course at the initial grades proceeding to specific vocational courses which may be elected as pupils advance each year. For pupils who do not pursue a special vocational course, industrial arts in senior high is a pre-technical elective.

It is most important in the total educational program that industrial arts and vocational education unite in believing that the major responsibility of the school is the transition to and preparation for life's work which will bring a satisfying adult life. Thus, a school program for all provides a comprehensive sequence of courses for potential dropouts, for pupils who desire vocational training, and for students preparing for higher education.

Students must be aware that, while they are studying in preparation for entry into the world of work, there is in society an ever changing variety of jobs. These changing types of jobs must reflect in the school offerings. No longer do men study and begin in one occupation never more to change as was possible under a less technical economy. Today the entry occupation or job is by no means the one held for life. To make an absolute career choice too early would be a serious mistake for many high school students. Increasingly post high school vocational education is becoming the important part of the total vocational preparation sequence.

Of one thing we may be certain. All pupils must have occupational and technical literacy for a satisfying life in our advance technological society.

Guiding Principles for Industrial Arts and Occupational Courses

1. All pupils should experience a sequence of courses as preparation for the adult world of work.

2. Occupational orientation experiences within the sequence of industrial arts must include psycho-motor activities.

3. The sequence and relationship of industrial arts and occupational education courses must have:
   a) consideration for the developmental process of career choice.
   b) alternate routes for advancing through the courses with possibilities for recycling when the need is apparent.
   c) a variety of time patterns and scheduling to provide flexibility.
   d) the provision for each pupil to gain competence at his individual developmental rate.
   e) a plan for the individual assessment of pupils for guidance purposes and the wiser choice of further education.
   f) acceptance by the total school faculty.

4. Financial support should be provided and available equally to industrial arts and occupational education courses.

5. The sequence of industrial arts and occupational education should be designed to eliminate the duplication of courses among subject areas.

6. The development and acceptance of a comprehensive sequential program which complements industrial arts and occupational education is imperative if all pupils are to experience realistic educational preparation for life in our expanding society.

RELATIONSHIP OF INDUSTRIAL ARTS AND VOCATIONAL EDUCATION COURSES

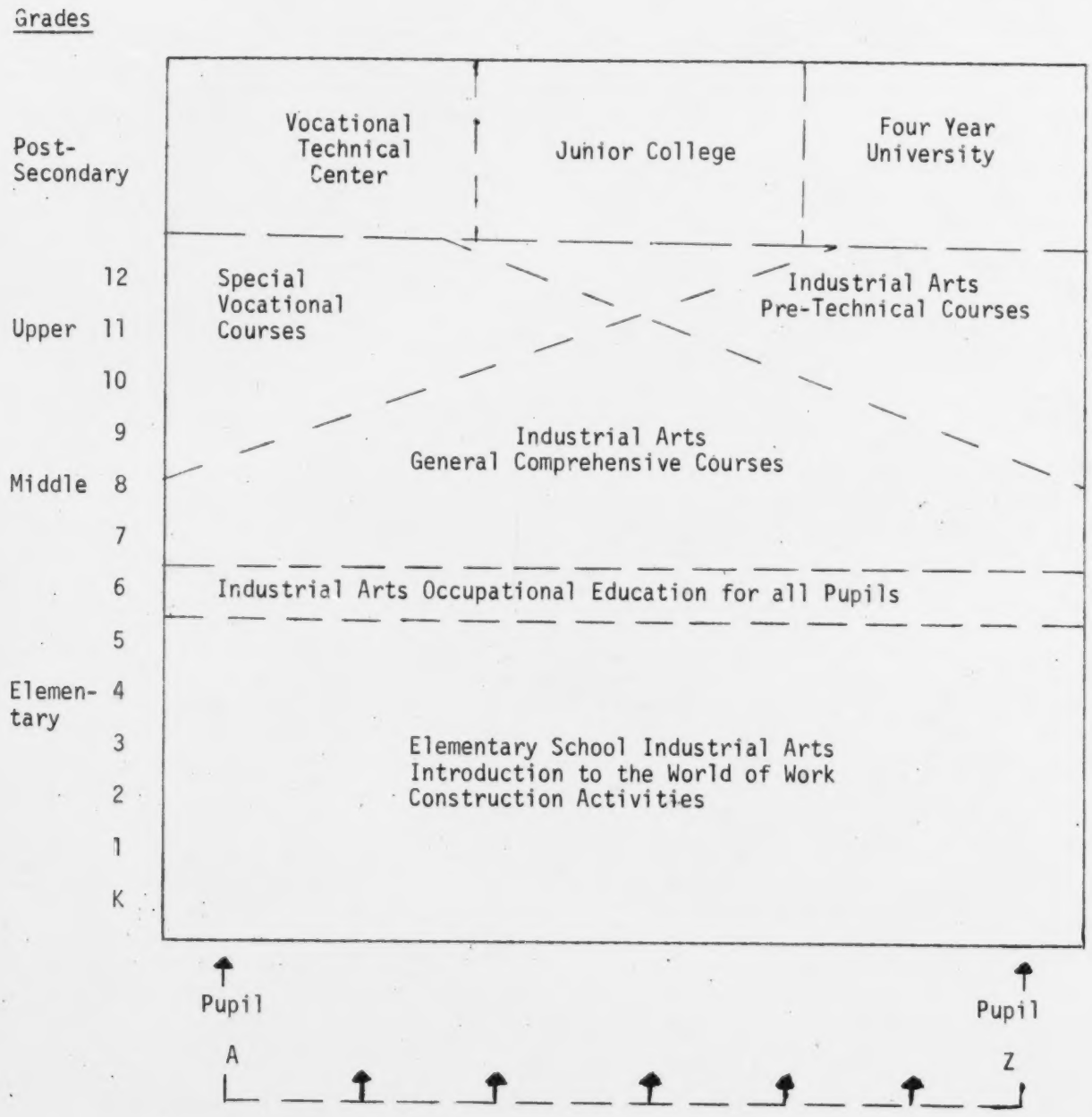


Chart I

The Task Force

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THE RECREATIONAL FUNCTION OF INDUSTRIAL ARTS EDUCATION

Evidences of recreational activity have been found in many of the excavations and other archeological finds; the artifactual evidences tend to support the contention that pre-literate man engaged in some forms of recreation. These recreational forms have been postulated to have followed the play of animals at first. Later in man's development, recreational forms were probably manifested in part in his craft activity.

The earliest historical writings concerning recreation and leisure appear to have been those of Plato and Aristotle. The Greek concept of leisure and recreation, particularly Aristotlian, has influenced subsequent thinkers and writers throughout recorded times. The rise of Christianity also influenced Western thought concerning leisure and recreation. These two influences, Greek and Christian, formed the primary basis of Western thought on leisure and recreation. Many of the philosophers and writers during the Middle Ages up until relatively modern times have been influenced by these two sources.

Throughout the last several hundred years, beginning primarily during the Renaissance, a recreational movement fostered by an increasingly favorable social climate was building toward a gradual acceptance during the late 19th centure. Such men as Commenius, Locke, Rousseau, Schiller, Froebel, and Spencer had advocated recreation as a part of man's experience, particularly relevant for the school.

Rationale for Recreational Industrial Arts

The Cardinal Principles of Secondary Education was apparently the first national, professional document to advocate recreation or leisure education as an objective of the school. Subsequent educational writers such as Bobbitt, Dewey, Chapmen, Counts, Russell, and Snedden also made contributions to the professional literature in advocacy of leisure education and recreational activity for the schools. The various reports of the Educational Policies Commissions of the National Education Association continued the more liberal tone of the Cardinal Principles and, likewise, advocated leisure education as a valid concern for American education. As additional validation for the objectives given by the Cardinal Principles in 1918, the Research Division of the National Education Association conducted a poll of teachers in 1967 to determine the values of these original seven objectives. The sample not only considered that the seven objectives were still relevant but also contended that the "worthy use of leisure" needed more emphasis in the school programs. It is interesting to note that John Dewey stated: "Education has no more serious responsibility than making adequate provision for enjoyment of recreative leisure..."

Industrial arts, too, has a history of concern with its recreational function. Traditionally the avocational-recreational objective of industrial arts has been generally accepted throughout the professional literature. Recreational-avocational is described as any activity involving tools and materials in which the participant engaged voluntarily for the purpose of his own satisfaction. Bonser, Warner, Proffitt, Warrick, Wilber, and Olson all included the avocational-recreational objective in their lists. Hostetler in Improving Industrial Arts Teaching found that this objective

was one of only two objectives repeated in all of the lists he surveyed. In addition, most of the major figures in the history of industrial arts education have made comments concerning this recreational function. Yet, the recreational function of industrial arts has played a relatively minor role in industrial arts programs.

Currently underway in this nation is a revoluation producing the post-industrial society with a national shift from a work based to what might well become a leisure-based culture. In 1900 a worker put in sixty man hours per week to earn a living; today the figure is approximately thirty-five. Sociologists and economists see the period ahead as the opportunity for the American to discover and to develop interests and talents which in a work-based culture go unnoticed or undeveloped.

Implications of Recreation in Industrial Arts

Since the recreational function of industrial arts is a necessary inclusion as a part of the complete program, then proper emphasis and planning should be given to the promotion of recreational outcomes. Such outcomes which might be appropriate for industrial arts recreation include: appreciations of aesthetics and craftsmanship; discovery of interests and aptitudes; adaptability to change; and recreational experiences for self-expression. Because the recreational experience itself is a personal experience, the individual goals would be derived from the individual's own interests and needs.

Recreation through industrial arts is applicable to all age levels and interests - childhood, adolescent, adult, retirement, and therapeutic groups. The particular situation would determine the specific activities which would characterize the program. Certain guidelines, however, may be appropriate to all levels. Among these are:

(1) Participants should be free to select, discover, experiment, express, create, develop, and achieve within a variety of media and activities.
(2) The environment should be participant-centered so that the teacher's role becomes that of an activity leader and resource person.
(3) Self-expression should be promoted free from external restraints such as grades, examination, and formalized instruction.
(4) Recreational industrial arts should be available to the child from the beginning of his formal educational experience throughout his life.
(5) Participation should be voluntary at all levels.
(6) The teacher should have a broad background in both technical and craft areas.
(7) Facilities would have to be flexibly designed to permit adaptability to a variety of activities and levels.
(8) Evaluation should be carried out with the participant's own goals and standards as the basic criteria; the results should be used in determination of the program effectiveness, not individual grades.

The changing socio-cultural emphasis creates a need for new programs and new additions to existing programs. Teacher educators should assume a leadership role in the promotion of recreation through industrial arts as a part of the overall industrial arts curriculum. In addition, new teacher education curricula should be developed to provide the needed teachers for recreation in industrial arts. Research

could identify and provide solutions for the needs and problems associated with such programs, both in the schools and in teacher-preparation. Teacher educators should be aware of the changing socio-cultural climate and the corresponding impact on education and leisure.

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INDUSTRIAL ARTS - ITS CONSUMER MISSION

I. Foundation Statement:

Since all people are consumers (buyers, users, and maintainers) of thousands of products of industry, it is imperative that Industrial Arts implement more dynamic efforts to achieve its consumer education goal.

II. Problem:

What may be the subject matter units, (knowledge and/or skill) learner experiences or activities, and teacher-learner resource materials to implement the consumer education mission of secondary school Industrial Arts?

III. Objectives:

A. To formulate a position definition of the term consumer education mission of Industrial Arts.
B. To propose possible subject matter units (broad units or daily lesson titles) that secondary school youth might study to achieve the consumer mission of of Industrial Arts.
C. To propose possible learner experiences and/or activities that secondary school youth might engage in to achieve the consumer education goal or mission of Industrial Arts.
D. To propose possible resource materials for use in an instructional program where optimum attention is directed toward emphasizing the consumer education goal of Industrial Arts.
E. To propose guidelines for professionals interested in achieving the consumer education mission of Industrial Arts.

IV. Concepts of Consumer Education (Implications):

A. Buying the products of industry..
B. Understanding product comparisons and making wise consumer choice.
C. Understanding advertising techniques.
D. Understanding technical features and operating principles of selected products.
E. Understanding of warranties, consumer responsibility, and protection.
F. Making minor repairs on consumer products.
G. Understanding financial aspects of product development and distribution.
H. Manifesting a concern for pollution free products.

V. Subject Matter Units:

A. Principles of advertising.
B. Product selection factors:
   1. Standards (safety, codes, ratings, and reports)
   2. Materials
   3. Processes
   4. Design
   5. Cost

C. Operating principles (vacuum tubes versus transistors, mechanical versus automatic transmissions, etc.)
D. Technical features (power requirements, fuels, horse power ratings, etc.)
E. Product maintenance and repairs (use of operating, care and maintenance manuals)
F. Warranties and customer guarantees
G. Selecting repairman
H. Financing and credit (installment buying, credit cards, banking procedures, insurance, etc.)
I. Home purchasing and financing

VI. Learning Experiences and/or Instructional Activities:

A. Study and evaluate advertising.
B. Study, compare and evaluate products.
C. Take field trips to industries, businesses, testing laboratories, financial institutions, and housing developments.
D. Conduct R & D activities in industrial arts laboratories (adhesives, bearing materials, finishes, pollutants, etc.)
E. Utilize human and material resources in the community (consumer protection agencies, such as Pure Food and Drug Administration, Federal Aviation Administration, Water and Air Quality Control, etc.)
F. Simulate industry through line production activity. (Function as an industry.)
G. Engage in repair and maintenance activities.

VII. Resource Materials:

A. Changing Times
B. Consumer Reports
C. Business and Industrial Catalogs
D. Maintenance and Operating Manuals
E. Newspapers and Magazines
F. Trade Journals
G. Research Agencies
H. Superintendent of Documents
I. Forest Products Laboratory
J. American Iron and Steel Institute
K. University Extension Services
L. Better Business Bureaus
M. U. S. News and World Reports (paperbacks)
N. Wall Street Journal
O. Applied Science and Technology Index

VIII. Recommendations:

A. That we identify the consumer needs of people.
B. That we make deliberate and concerted efforts to provide experiences and/or activities to satisfy the identified consumer needs.
C. That we take steps to evaluate the effectiveness of the instructional program in terms of meeting consumer needs.

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INDUSTRIAL ARTS FOR SELF-REALIZATION: The Discovery, Development, Release and Realization of Human Potential

The development of this paper centers on two basic postulates regarding education as a self-realizing experience.

(1) Self-realization has long been a widely accepted purpose of education in America.

(2) Industrial arts, as an accepted part of general education, is in a position to make distinct and unique contributions to the development of individual potential to its fullest within the context of technology.

The remainder of the paper is organized to accomplish three purposes: (1) to define precisely what is meant by self-realization, (2) to furnish evidence from the literature in support of the above postulates, and (3) to offer suggestions to the industrial arts profession which should prove useful as it seeks to achieve its objective of assisting the individual in the process of self-realization.

Self-Realization: A Definition. The term self-realization refers to one's need for self-fulfillment - the human need to become, in reality, what one is potentially - the need one has to realize his talent potential to the fullest extent possible. Self-realization might be though of more simply as the individuals need to become more and more what he actually is - to eventually become everything that he is capable of becoming. It infers the discovery, development, release, and realization of the sum total of latent powers which are within the individual - powers which can be strengthened or diminished by the educative process. It includes the powers of reasoning, problem solving, imagining, inventing, creating, construction, and expressing. It also includes the potential for leadership and followship along with the potential for inspiring others to action. It is seen as the individual's dynamic interaction with his total environment.

Postulate #1. There is abundant evidence in the literature to support the position that self-realization has long been a widely accepted purpose of education in America.

With regard to this point, the 1960 Report of the President's Commission on National Goals contains the following statement:

> The paramount goal of the United States was set long ago. It is to guard the rights of the individual, to ensure his development, and to enlarge his opportunity. It is set forth in the Declaration of Independence ... and adopted by the Continental Congress on July 4, 1776. (10, p. 1)

In the same publication, Dr. John W. Gardner, in consultation with forty leading educators, made clear the importance of self-realization as he wrote:

> ...a society such as ours dedicated to the worth of the individual ... has special reasons for valuing education. Our deepest convictions impell us to foster individual fulfillment. We wish each one to be worthy of a free society, and capable of strengthening a free society ... each should be able to develop to the fullest in his own style and to his own limit. (10, p. 81)

Additional evidence that self-realization is a major goal of American education is found in the President's Commission report, Higher Education for American Democracy. In discussing the objectives of general education, the Commission stated:

> The first goal in education for democracy is the full, rounded, and continuing development of the person. The discovery, training and utilization of individual talents is of fundamental importance in a free society. To liberate and perfect the intrinsic powers of every citizen is the central purpose of democracy, and its furtherance of individual self-realization is its greatest glory. (9, p. 9)

Over the years, numerous statements of the goals of education in America have been published. These statements represent the thinkings of leaders in the fields of business and industry, government, and education. The common thread woven through them all is the concern that each individual shall have the opportunity through education to realize his maximum potential as a person.

Among the more recent statements of the aims of American education is the 1961 report of the Educational Policies Commission. This report entitled The Central Purpose of American Education summarizes the long existing relationship between education and individual fulfillment with the following statement:

> The basic American value, respect for the individual, has led to one of the major charges which the American people have placed on their schools: to foster that development of individual capacities which will enable each human being to become the best person he is capable of becoming. (4, p. 1)

Postulate #2. Industrial arts has long been recognized as a part of general education. It is regarded by the profession as the general education aspect of the industrial education complex. Just as general education, with the individual as its center of focus, is charged with the development of human potential to its fullest, so is industrial arts. Industrial arts is called upon by the school to play the unique role of assisting the individual in the process of self-realization within the context of technology.

There is increasing evidence that leaders in the field of industrial arts are recognizing the important and unique contributions that the discipline can make toward developing the talent capability of individuals to the fullest.

In discussing the responsibilities of industrial arts to the development of the individual, Hornbake has written:

> ...Boys and girls when considered as a group, possess great diversity of talent ... Some children are especially adept in performance of a verbal and literary nature. Others find greater success when dealing with mathematical processes; still others are at their best in aesthetic expression. The one most certain way of discovering talent is to provide experience situations in which these talents may appear. If you want to discover talent for music, music experiences must be provided; if you want to discover talent in painting, painting experiences must be provided. And so, too, must we provide experiences in technical education if we wish to discover technical abilities. (6, p. 106)

A study by Hostetler found that over the years industrial arts had claimed twenty-five objectives, many of which were overlapping. In conclusion he formulated four major objectives that he believed to be unique to industrial arts. Each of these four objectives was stated so as to emphasize the development of the individual in relation to his skills, abilities, and understandings. The second of these objectives, "to discover and develop talents of students in the technical fields and applied sciences," points up the unique contributions that industrial arts can make to the discovery and development of human potential.

In discussing this objective, Hostetler wrote:

> One of our social responsibilities is to provide opportunities for the individual to develop to his fullest ... It is the school's responsibility to help students discover and develop their talents, and it is the responsibility of industrial arts to help them discover and develop their talents in technical fields and applied sciences... Industrial arts provides experiences in technical education which provides the opportunity for the discovery of technical abilities. (11, p. 20)

The 1960 Washington Conference report, Improving Industrial Arts Teaching, made numerous suggestions for the professor to consider. The first of these suggestions was:

> 1 - The fundamental justification of industrial arts ... in the public school is two fold. If properly taught, industrial arts can: (1) develop insight and understanding about the technological side of our American society for all students, and (2) discover and develop the technical talents possessed by some of the pupils in the schools. Industrial arts ... enables students who possess technical talents to discover and develop them. This nation cannot overlook any talent possessed by its citizens, but must develop all talents to their fullest. (11, p. 65)

Olson has regarded the contributions of industrial arts to self-realization important enough to be included as one of the primary objectives of the disciplines. He states this objective as follows:

> To assist the student in the discovery, development, release and realization of his talent capability within the context of technology. (8, p. 5)

Olson again emphasized the important role to be played by industrial arts in releasing human potential as he made the following comments on the bases for a new industrial arts.

> It is the responsibility of American education that through it, individual potential be discovered and developed, released and realized.
>
> The individual has a nascent potential for reasoning and problem solving, imagining and creating, and constructing and expressing with materials. From this comes the technology.
>
> Then, it falls to industrial arts to contribute to the realization of individual potential within the context of technology. (7, p. 1)

Maley is continually reminding his readers that any industrial arts program should have at the center of its focus the development of people as opposed to the development of things. Typical of his position on this point, is the following statement from his publication, Contemporary Methods of Teaching Industrial Arts:

> ...Industrial arts as an integral part of American education must play an important role in meeting individual and national goals. --
>
> To guard the rights of the individual;
> To provide for individual fulfillment;
> To achieve the promise that is in him;
> To be worthy of a free society;
> To aid in the individual's capacity of strengthening a free society. (5, p. 4)

Maley concludes in this significant publication that:

> The challenge to make industrial arts an experience in discovery, an experience in inquiry, an experience aimed at the maximum fulfillment of people, capable of assuming their duties and responsibilities in a free society, is in reality the challenge of thought and action for industrial arts in the years ahead. (5, p. 14)

Weber, in commenting on the role of industrial arts in the future, has suggested "the skill of learning to know one's self" as one of the six skills needed for the liberally educated person of tomorrow.

Regarding this skill Weber notes that:

> Certainly one of the functions of education must be to help people realize honestly what they can do well and what they can't do; what they are; and what they are not; when they have succeeded and when they have failed. In short, in order to be a mature member of society, a person must learn to know himself. This capacity, or skill as I have termed it, is sometimes referred to as self fulfillment or self realization. Whatever it is called, its importance is self evident and its attainment must be the concern of those who would be worthy of the title <u>teacher</u>. (12, p. 8)

Not only have professional leaders stressed the self-realization goal of industrial arts, it is significant to note that both the American Industrial Arts Association and the American Vocational Association have likewise recognized that industrial arts has an important role to play in the discovery and development of human potential.

Official publications of the American Industrial Arts Association list four unique objectives of industrial arts. The second of these is stated as follows:

> To discover and develop student talents in industrial-technical fields. Students have a diversity of talents. The school's responsibility is to assist students in discovering and developing these talents. It is the responsibility of industrial arts education to identify special talents in industrial-technical fields. (1, p. 4)

Supporting the position taken by the American Industrial Arts Association, the Industrial Arts Division of the American Vocational Association has proposed five major objectives for industrial arts. One of these is concerned with self-realization and is stated as follows:

> Goal II - Discover and Develop Talents, Aptitudes, Interests, and Potentialities of Individuals for the Technical Pursuit and Applied Sciences. (3, p. 10)

The association further clarifies this goal with the following comments:

> Students have a diversity of talents. Opportunities for students to discover abilities and develop to their fullest are essential to the basic education of all youth. Efforts should be made to allow for differences in abilities, interests, and needs, and to ascertain which learning experiences are the most significant for the success of each individual. Thus, a student can better assess his potentialities and interests when making an occupational choice, understand his environment, and condition himself to the rapidly changing demands of technology and society.

> The ramification of this goal long have been a major concern of industrial arts, especially on the junior high school level. In the past, a well-conducted and planned industrial arts program, without a doubt, has been instrumental in assisting youth to make occupational decisions. If it accomplished nothing else, an industrial arts program can be considered justifiable on the basis that it does provide students with experiences which for the most part are unobtainable in any other high school subject. (3, p. 10)

Unique Contributions of Industrial Arts to Self-Realization. The chief tasks of this paper, thus far, have been twofold: (1) to define self-realization essentially as one's need to discover, develop, release, and realize his talent potential to the fullest, and (2) to offer evidence that American education has long regarded self-realization of the individual as one of its major responsibilities. The remaining task is to make suggestions which should prove useful to the industrial arts professions as it seeks to accomplish its unique objective of assisting the individual in the process of self-realization within the context of technology.

The development of human potential is seen as a multi-dimensional, many faceted, problem involving the human mind, body, and spirit. Regardless of the complexity of the problem, the American school system has accepted the challenge of managing educational content and the learning experience in such a way that each student will be provided the maximum opportunity to discover, develop, release, and realize his total talent potential.

Neither experience nor research has provided complete answers to the question of what releases human potential in a given situation. Factors which may effect release are numerous and they are complex in their interrelationships and in the timing with which they should be introduced. What leads to discovery and eventual realization of potential in one person may leave another completely unmoved. Furthermore, it is possible than an experience may fail to cause response in a person at one time whereas earlier or perhaps later, this same experience might be an effective motivator. As DeHaan and Doll have noted, "The human being is always growing, changing, adding new experiences, forgetting old ones, and refusing to be simplified so as to conform to a neat educational theory." (2, p. 17) Thus, it would appear that one should look with suspicion at dogmatic statements about specific techniques or procedures which will or will not work to bring the individual closer to self-realization.

It should be noted that the teacher's emphasis on developing human potential is a matter of degree rather than an all-or-none matter. Without doubt, all teachers stress this objective to some extent, and for some students more than others. A major purpose of this paper is to encourage industrial arts teachers to become more actively involved in utilizing the unique advantages of industrial arts experiences as they seek to discover, develop, and release student potential in technical pursuits and applied sciences.

To this end, the following suggestions may prove of interest and worth:

(1) The beginning point for the teacher who is interested in maximizing opportunities for self-realization is to develop a personal open mindedness concerning each learner's potential, together with a sense of obligation to help each learner realize this potential. The teacher cannot afford to judge potential merely by intelligence quotients and records of scholastic achievement.

(2) The teacher must emphasize discovery of student potential. This can be done in part by going away from traditional approaches which channel the student through a prescribed set of experiences and by dropping approaches which allow the student to problem solve, experiment, create, imagine, construct, and invent in areas of particular interest, challenge, and relevance to him as an individual. Also particular attention should be given to providing opportunities for the student to discover his strengths and weaknesses with respect to leadership and followship and to experience the myriad of social interactions required by daily life.

(3) Once the student has discovered his powers in a particular area, the teacher's role becomes one of assisting him in the development of that potential to the fullest extent possible. This job may be facilitated by offering encouragement to the student and by making every effort to enrich the total learning environment. Not to be overlooked is the teacher's obligation to become professionally aware of the total range of development tasks of youth at the various maturity levels. His teaching should be regulated according to these developmental tasks.

(4) The teacher must recognize that the development of potential leads to its release for useful service to the individual and society. Neither the individual not society, can afford the luxury of unreleased human potential.

(5) While the school helps with the realization of human potential, it is not likely to make the total contribution to ultimate self-realization or fulfillment. Full self-realization is the result of many experiences, beginning at birth, through which the individual becomes all that he is potentially. The teacher must expect a fair balance between success and failure in both the students' efforts and his own.

(6) The teacher must become proficient at using individualized instruction in its various forms if the diverse talents of each individual are to be fully developed and realized. When teaching is individualized, the emphasis is on the student as a person, the teacher as a person, and the interaction between them. The teacher must recognize and respond to the emotional reactions of the learner as well as to his scholastic achievements. A natural advantage of the industrial arts laboratory setting is that it lends itself to teacher-to-student interaction in an environment which closely simulates actual experience. The teacher should recognize this and capitalize upon this unique characteristic of industrial arts instruction.

(7) In many cases, massive barriers exist which reduce a student's potential to develop and become what he is capable of becoming. The teacher should be aware of these barriers which include racial segregation, cultural deprivation, emotional maladjustments and physical and mental handicaps. Industrial arts is uniquely adaptable to methods and approaches which will assist such special classes to realize their talent potential in spite of such barriers.

(8) Industrial arts should be a program of career orientation rather than career preparation. It should provide opportunity for try-out experiences of many kinds as related to technical pursuits and applied sciences. The teacher should strive to offer as broad a program as possible if the great diversity of student talent is to be discovered, developed, and eventually realized in the world of work.

(9) More opportunity should be provided for students to problem solve with the materials, tools, products, and processes, of industry. This can be accomplished by the initiation of courses in research and development, industrial design, and research and experimentation. Courses such as these have proved very effective in arousing the curiosity, challenging the imagination, and consequently discovering and developing the potential of individual students.

(10) The final suggestion is concerned with the improvement of industrial arts teacher education. Here greater emphasis should be placed on preparing teachers who are at least as competent at developing people as they are at developing projects. This emphasis should apply at both the pre-service and graduate study levels. To accomplish this, industrial arts teacher educators must educate or re-educate themselves in the principles of human growth and development and in approaches and methods which appear most likely to be successful in developing the talent potential of youth.

Everywhere in America there is evidence that rapid social and technological change have brought about an era of cultural disunity in our society. Undoubtedly, increased individual responsibility and committment are demanded by the times. If individuals are to become increasingly responsible and committed to personal and national goals, then their potential as individuals must be discovered, developed, and released. This is demanded by the times, but not in the sense that more technical and scientific personnel are needed by industry, and that educators should place major emphasis on the development of such personnel. Rather the times demand that the potential of all individuals be realized because of the infinite benefits which the realization of full potential can eventually offer the individual and the society in which he lives. Herein lies the major challenge for industrial arts in the years ahead.

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